Covenant Health *Compassionate care led by Catholic values*	MASIMO RADICAL 7 Signal Extraction Pulse CO-Oximeter	**Women's Health Manual** **MCH Only**
		Policy Group: Cardiovascular
Approved by: **Heather Crosland** Director, Women's Health, Covenant Health, GNH/MCH Site Lead Anesthesia-MCH Site Lead Obstetrics-MCH		**Date Effective** November, 2012
		Next Review July, 2015

Purpose

To provide staff with guidelines for safe use and application of Radical 7.
To ensure that the equipment is available for use at all times.
To ensure that the equipment is cleaned according to infection control guidelines.

Policy Statement

This policy provides clear direction as to the responsibilities for those who use Masimo Radical 7 equipment.

Applicability

All Misericordia Labour and Delivery Staff, anesthetists and respiratory technicians.

Responsibility

It is the responsibilty of all staff who use this equipment to follow the policy and procedure as outlined below.
To make sure that the Radical 7 is continuously plugged in and kept in either theatre 345 or 348 ready for use .
The uses are outlinesd in the Indication section

Equipment

Masimo Radical 7 (Signal extraction pulse CO-Oximeter with rainbow technology)

The Radical 7 is capable of assessing hemoglobin.

This machine is mounted on a pole and kept plugged in one of the L&D theatres.

The screens give data of SpO2, SpCO ,SpMet and SpHb .

New supplies will be kept in sterile core in the drawers as marked.

Procedure

Indications

The Radical 7 can be used for continuous and non-invasive measurement of :

- Arterial oxygen saturation in blood.
- Measurement of the levels of total hemoglobin (SpHb) in arterial blood.
- Levels of metheglobin concentration(SpMet) in arterial blood.
- Levels of carbon monoxide concentration (SpCo).

Contraindications

- Does not replace laboratory work required when Mass Transfusion Protocol initiated.
- May need laboratory verification of accuracy for patients that are hemodynamically unstable.
- Patients with extremely impaired peripheral circulation may have a delayed reading or no reading at all. This maybe due to cold, shivering or shock.

Sensor Limitations

- Patients who have nail varnish on and false nails may not have an accurate reading due to inability of sensor to read.
- Patients with long nails may also give an inaccurate reading due to the difficulty of applying the sensor correctly.
- If the cover is not applied over the sensor, a false reading may be produced. This may be especially true if there is excessive ambient light sources eg. OR lights.
    - Elevated levels of Carboxyhemoglobin = inaccurate SpO_2
    - Methehemoglobin = inaccurate SpO_2
    - Bilirubin = may cause erroneous SpO_2, SpMet, SpCO and SpHb readings
    - Sensors applied too tightly = inaccurate readings
    - Low arterial perfusion = may give inaccurate SpHb and SpOC readings.

Cautions

- Caution when comparing SpO_2, SpCO, SpMet and SpHb results from Radical 7 to results from laboratory blood gases that are drawn . As it is dependant on when blood is drawn and results received and when the readings from the Radical 7 are taken to compare as well as amount of IV fluid that is rapidly being infused at that time.

- The Radical 7 reads and adjusts with the pulse. Skin erosion and pressure necorsis caused by high levels of bilirubin may cause erroneous readings of SpO_2, SpCO, SpMet and SpHb.

Potential Complications

Tissue damage can be caused by incorrect placement of the sensor when wrapped too tightly.

Secure arm safely above level of heart to avoid injury to patient. Sensor placed below the heart, e.g. arm dangling off the table would give inaccurate reading.

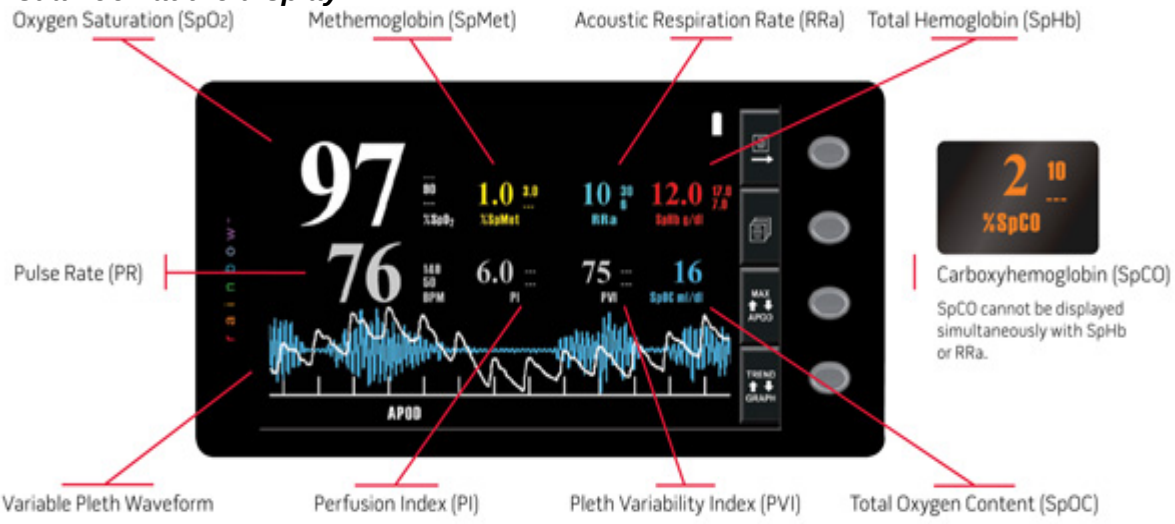
Procedure

Principles of Operation

Oxyhemoglobin, deoxyhemoglobin, carboxyhemoglobin and methemoglobin and blood plasma constitutes differ in their absorption of visible and infrared light.

The amount of arterial blood in tissues changes with your pulse (photoplethysmography). Can distinguish a true arterial oxygen saturation.

Visual look at the display.



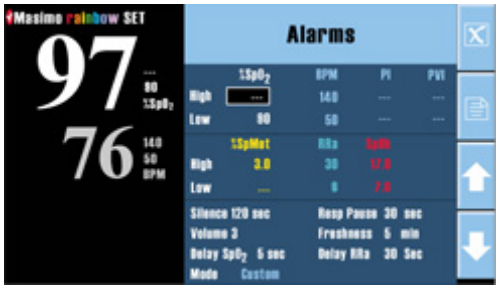
Normal View

Allows for continuous monitoring of all parameters along with a plethysmograph (pleth) wave form and Signal IQ indicator (below pleth) to provide confidence in the quality of the values displayed. If the device is RRa-enabled*, its waveform can be overlayed on the pleth waveform, enabling deeper understanding of the patient's respiratory status.

Procedure

Trend View

The quick-trend feature allows for one-touch access to vital parameter trending information to instantly evaluate patient condition and illness severity. Auto-scaling feature allows the y-axis to automatically change with fluctuations in the measurement value.



Simplified Alarm Management

One-touch menu provides quick access to the most commonly used features and allows for quick configuration and management of parameter alarm settings.

Nursing **See next page for diagrams**

Attach the direct cable to the optical sensor and monitoring can begin by:

- Make sure Radical-7 is plugged in.
- Press the Power/Standby button to turn on the Pulse Co-Oximeter.
- Make sure the display window is free of alarm and failure messages.
- Verify high and low alarms if necessary.

Attaching the sensors :

1. Before the Radical-7 can be used you need to check that it is fully charged. The Radical-7 must be plugged in at all times and can be located in one of the OR's.
2. When requested for use by anesthesia, collect the equipment you need. This includes the cable, disposable sat probe and reusable optical sensor as well as the ambient shield accessory.
3. Connect direct patient cable firmly into the front of the Radical-7 port on the right side.

4. Attach the disposable sensor (adhesive) to the reusable optical sensor by clipping together black area of sensor and optical sensor and clipping in both white areas of sensor and optical sensor together. Make sure that they are locked in place. (if the reusable sensor does not attach or lock in place a new reusable sensor may be required.)
5. Apply Sensor to the finger by following the diagram on the sensor applying to the fleshy part first. (The finger should be well perfused and clean of debris). Make sure that the red lines become one continuous line when attached for accurate readings. (Do not use extra tape as this may cause an inaccurate reading and ischemia). Avoid placing the sensor on any extremity that has arterial catheter or blood pressure cuff.

Successful Monitoring = Place sensor on area that has unrestricted blood flow and do not secure with tape. Do not place near potential electrical interference (e.g. cautery machine)

NOTE: Monitor will read saturation first it may take up to 2mins to get an accurate hemoglobin

To adjust the screen view, use the button circled in green.

Safety

Sensors must be repositioned every 4hrs to a new site

If circulation is inadequate and especially if patient has poor perfusion, please reposition sensor every 2hrs.

Radical 7 disposable equipment is DPO. Please let the Unit Clerk know when you have used to the critical level.

Take the direct cable sensor and connect to right hand side of the face of the Radical 7.

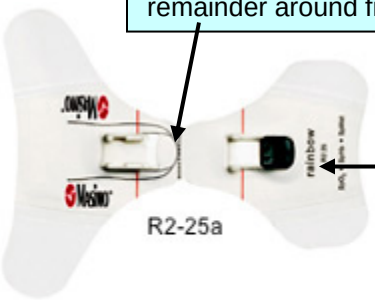
Shield cover is placed over sensor when on patient to protect sensor from light from ambient light

Ambient shield cover

Disposable sat probe sensor.
Connect to the patient by following diagram on sensor (Placing over fingernail)

Note: Please make sure that the red lines are CONTINUOUS with each other .

1. Place over fingernail and wrap remainder around finger.



2. Fold over the finger 1st and wrap around finger

3. Clip black to black and white to white

Connect to main cable on front of machine

Reusable Optical Sensor Do not dispose of unless probe not working . New one in attached basket or sterile core

DOCUMENTATION BY ANESTHESIA

- Order for application required.
- Once it is applied probe must be assessed and assessment charted every 30-60mins.
- The sensor should be checked every 30-60mins for circulation distal to the sensor and this check documented.

DOCUMENTATION BY NURSING

- Please chart who requested the use of the Radical 7, the reason for the request, the time applied and by whom.

Removing the sensor

- Detach main cable from the optical sensor.
- Remove the adhesive sensor from the optical sensor.
- Remove and discard the disposable patient adhesive sensor.

Cleaning the Reusable optical sensor

- Wipe the reusable optical sensor by wiping with 70% isopropyl alcohol pad.
- Wipe cable outside of the Radical 7 with Virox or CPS wipes.
- Wipe screen with the Grand & Toy computer wipes.

References

Masimo Corporation : Radical -7 Signal Extraction Pulse CO-Oximeter with Rainbow Technology: Operator Manual can be obtained from http://www.masimo.com/pdf/radical-7/LAB4540E_radical-7_brochure.pdf

Masimo Corporation : Rainbow ReSposable Pulse Co-Oximeter Sensor System package insert for Adhesive and reusable Sensors.2012 for 20R2-25a adult disposable optical sensor and R2-25r adult reusable opt Radical 7 rainbow information about product and technology. Retrieved on July 5th 2012 from http://www.masimo.com/rainbow /Radical7.htm on

Masimo Corporation : Radical -7 Signal Extraction Pulse CO-Oximeter with Rainbow Technology: Operator Manual can be obtained from http://www.masimo.com/pdf/radical-7/LAB4540E_radical-7_brochure.pdf

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Radical-7 rainbow information about product and technology. Retrieved on July 5th 2012 from http://www.masimo.com/rainbow /Radical7.htm.